winter months, except in the east Gulf States, along the Atlantic coast generally, in the lower Lake region, upper Ohio Valley, and northern portion of the upper Lake region. That storms are less frequent in March in portions of the Great Lakes is not entirely borne out by the figures given in Professor Garriott's Bulletin K, Storms of the Great Lakes (of which he kindly permitted me to see the proof sheets), as for the 25-year period 1876–1900, December shows 35 storms, January 16, February 14, and March 22. In this Bulletin, however, only very severe storms, dangerous to shipping, were considered.

March windstorms, apparently, are not the ones most frequently attended with snow, for only at Boston and St. Paul were they so. No snow occurred with the March storms at Charleston. The December storms were most frequently attended with snow at Montgomery; the January, at Buffalo, Dodge, Galveston, Marquette, Nashville, and Omaha; and during February at the remaining stations.

It will, perhaps, surprise many persons to learn that the windstorms of the winter months and March, are generally attended with temperatures above the normal, and in numerous instances the proportion of temperatures above normal on windy days over those of below normal temperatures, is quite marked. In January the greater proportion of strong winds were attended with temperatures below normal at Montgomery and New York; in February at Boston, Chicago, Indianapolis, Montgomery, New York, Pittsburg, and St. Paul; in March at Boston, Montgomery, and New York; and during all the four months at Omaha and Galveston, the proportion at the latter city being quite marked.

The idea that if March comes in like a lion it will go out like a lamb, or vice versa, is not borne out by the figures, for on both the first and last days of the same month the wind did not reach the verifying velocity from 70 to 95 per cent of the time at the various stations. The greatest number of times March came in stormy was six at Marquette; and went out under like conditions the same number of times at Norfolk.

The number of times the wind reached the verifying velocity at the various stations, at the time of the vernal equinox, March 21, ranged from one to six, or from 5 to 30 per cent of the time.

A WATERSPOUT OFF HATTERAS.

By MR. THOMAS B. HARPER.

Mr. T. F. Townsend, Local Forecast Official, forwards several photographs of waterspouts, taken by Mr. Thomas B. Harper of Philadelphia, and observed off the Hatteras Lightship, on the afternoon of April 26, 1903. Although the photographs, owing to the absence of any means for determining the true dimensions of the spouts, do not add to our knowledge any definite numerical details, yet the general description given by Mr. Harper is worthy of reproduction and reads as follows:

In reply to your request I take pleasure in inclosing you photographs of the waterspouts which occurred off Hatteras Lightship, about 3:15 p. m., April 26, 1903, on the north edge of the Gulf Stream, as seen from steamship *Watson*.

There were 5 distinct spouts in all; we were about 6 miles, a little south of east, of the lightship at the time, steaming about north; the wind had shifted in the early morning from about northeast to strong southwest; the rainstorm formed about noon, we were running into a light rain about 3 p. m.; it was, however, raining hard north and east of us. The storm was a well-defined line north and south, with a clear sky to west, with strong wind coming out of northwest. After the storm struck us we followed the storm for sometime, the spouts being on our port for over half an hour. The last one that formed finally worked so close to us that we were compelled to turn quickly to starboard and run due south; the spout worked so close to us that the steamer cleared it less than one-quarter of a mile. It was then so dark overhead that the negatives did not show the spout, although we were so close we could hear the roar of the wind, and see the swirl and suction of the column of water from the surface. As the spout passed us the temperature fell from 75° to 55° in a few minutes, with strong northwest wind.

The photos show views of two other spouts, the first one being too far off to photograph. We had in full view, at one time, three distinct spouts within one to one and one-half miles.

HAWAIIAN CLIMATOLOGICAL DATA.

By CURTIS J. LYONS, Territorial Meteorologist.

OBSERVATIONS AT HONOLULU.

The station is at 21° 18′ N., 157° 50′ W. It is the Hawaiian Weather Bureau station Punahou. (See fig. 2, No. 1, in the MONTHLY WEATHER REVIEW for July, 1902, page 365.)

Hawaiian standard time is 10h 30m slow of Greenwich time. Honolulu local mean time is 10h 31m slow of Greenwich.

The pressure is corrected for temperature and reduced to sea level, and the gravity correction, —0.06, has been applied.

The average direction and force of the wind and the average cloudiness for the whole day are given unless they have varied more than usual, in which case the extremes are given. The scale of wind force is 0 to 12, or Beaufort scale. Two directions of wind, or values of wind force, or amounts of cloudiness, connected by a dash, indicate change from one to the other.

The rainfall for twenty-four hours is measured at 9 a. m. local, or 7.31 p. m., Greenwich time, on the respective dates.

The rain gage, 8 inches in diameter, is 1 foot above ground. Thermometer, 9 feet above ground. Ground is 43 feet and the barometer 50 feet above sea level.

Meteorological Observations at Honolulu, May, 1903.

Date.	Pressure at sea level.	Temperature.		During twenty-four hours preceding 1 p. m. Greenwich time, or 1:30 a. m. Honolulu time.									Total rainfall at 9 a. m., local time.
				Temperature.		Means.		Wind.		Average cloudiness.	Sea-level pressures.		
		Dry bulb.	Wet bulb.	Maximum.	Minimum.	Dew-point.	Relative humidity.	Prevailing direction.	Force.		Maximum.	Minimum.	
	*	†	†			‡	‡		§				
1	30.00	69	67.5	82	67	66.7	82	se-ne.	2–0	4–10	30.06	29.99	0.03
2	30.01	73	67.5	81	67	66.0	77	s-ne.	2	8–2	30.06	29.96	0.00
3	30.04	68	65.5	82	70	63.7	67	ne.	3	4	30.09	29.99	0.00
4	30.03	68	64	82	67	62.3	70	w-ne.	1–3	8–1	30.08	30.00	0.00
5	30.04	72	65.3	80	66	60.3	65	nne.	3	4–1	30.08	29.99	0.03
6	30.02	72	65	80	67	60.3	64	ne.	4–5	4–1	30.10	29.99	0.02
7	30.04	71	64	80	71	61.3	66	ne.	4–5	3–7	30.09	30.01	0.04
8	30.05	70	64.5	79	67	60.0	63	ne.	4–5	4	30.11	30.01	0.05
9	30.05	71	65	78	68	61.7	68	ne.	4	4	30.11	30.02	0.05
10	30.07	67	63	80	69	62.0	67	ne.	3	3–5	30.12	30.03	0.02
11	30.04	70	65	80	66	60.5	67	ne.	3–1	3–8	30.12	30.04	0.02
12	30.01	72	65	78	69	61.3	70	ne.	2–0	8–3	30.06	30.00	0.00
13	30.04	72	67	81	68	60.5	62	ne.	3	4	30.09	30.00	0.05
14	30.03	72	67.5	80	70	64.3	72	ne.	3–5	5	30.10	30.02	0.01
15	29.99	73	67	81	71	63.5	67	ne.	4	3	30.06	29.97	0.00
16	30.01	67	65	81	69	64.7	72	se-ne.	1–0	7–3	30.06	29.97	0.00
17	30.02	68	66.5	81	66	65.7	80	sw-n.	1–0	6	30.08	30.00	0.04
18	29.99	72	70	82	68	65.5	72	s-ne.	1–0	5–2	30.05	29.97	0.20
19	29.98	72	67	81	67	67.0	76	s-ne.	1	6–2	30.05	29.98	0.05
20	29.95	70	68	78	71	67.0	80	s-ne.	1–0	3–9	30.03	29.96	0.36
21	29.99	74	67.5	83	68	67.0	78	se-ne.	2–0	8–4	30.02	29.94	0.02
22	30.04	74	69	82	72	65.0	70	ne.	3–0	5	30.09	29.99	0.05
23	30.06	73	65	81	71	64.0	68	ne.	4	5	30.14	30.04	0.02
24	30.06	72	67	80	72	60.5	62	ne.	5	3	30.12	30.04	0.04
25	30.05	73	66	80	70	63.3	67	ne.	5	5–3	30.12	30.04	0.03
26	30.04	73	66	79	72	63.0	68	ne.	5	4	30.09	30.02	0.06
27	30.09	73	66	80	69	63.3	71	ne.	5	5	30.14	30.04	0.17
28	30.07	72	67	77	70	64.3	74	ne.	5	8	30.13	30.06	0.11
29	30.04	72	65	79	69	63.3	69	ne.	4	7	30.08	30.02	0.11
30	30.05	73	64.5	80	70	61.5	64	ne.	3–4	4	30.09	30.00	0.06
31	30.10	72	67.5	79	70	61.5	65	ne.	4	4	30.15	30.06	0.22
Sums													1.86
Means.	30.032	71.3	66.1	80.0	69.0	63.2	69.7		3.0		30.089	30.005	
Departure.	+.015					—0.7	—2.8						—0.82

Mean temperature for the month of May, 1903, (6 + 2 + 9) ÷ 3 = 74.2°; normal is 74.2°. Mean pressure for the month of May, 1903, (9 + 3) ÷ 2 = 30.044; normal is 30.029.

* This pressure is as recorded at 1 p. m., Greenwich time. † These temperatures are observed at 6 a. m., local, or 4.31 p. m., Greenwich time. ‡ These values are the means of (6 + 9 + 2 + 9) ÷ 4. § Beaufort scale.

Maximum thermometer set at 9 p. m. and minimum at 2 p. m., local time.

GENERAL SUMMARY FOR MAY, 1903.

Honolulu.—Temperature mean for the month, 74.2°; normal, 74.2°; average daily maximum, 80.0°; average daily minimum, 69.0°; mean daily range, 11.0°; greatest daily range, 15°; least daily range, 6°; highest temperature, 83°; lowest, 66°.

Barometer average, 30.044; normal, 30.029; highest, 30.15, lowest, 29.94; greatest 24-hour change, that is, from any given hour on one day to the same hour on the next, 0.06; lows passed this point 15th to 22d; highs, 10th, 23d, and 31st.

Relative humidity average, 69.7 per cent; normal, 72.5 per cent; mean dew-point, 63.2°; normal, 63.9°; mean absolute moisture, 6.39 grains per cubic foot; normal, 6.53 grains.

Rainfall, 1.86 inches; normal, 2.68 inches; rain record days, 25; normal, 19; greatest rainfall in one day, 0.36, on the 20th; total at Luakaha, 6.94; normal, 9.25; at Kapiolani Park, 0.27; normal, 1.17.

The artesian well water level fell during the month from 34.75 to 34.65 feet above mean sea level. May 31, 1902, it